

FORM PTO-1390 (Modified) (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 112740-516	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR	
INTERNATIONAL APPLICATION NO. PCT/DE00/02393		INTERNATIONAL FILING DATE July 21, 2000		PRIORITY DATE CLAIMED July 21, 1999	
TITLE OF INVENTION MOBILE TELECOMMUNICATION TERMINAL					
APPLICANT(S) FOR DO/EO/US Markus Imhof					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below. 4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). 11. <input checked="" type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409). 12. <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210). 					
Items 13 to 20 below concern document(s) or information included:					
<ol style="list-style-type: none"> 13. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 14. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 15. <input checked="" type="checkbox"/> A FIRST preliminary amendment. 16. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 17. <input checked="" type="checkbox"/> A substitute specification. 18. <input type="checkbox"/> A change of power of attorney and/or address letter. 19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 22. <input checked="" type="checkbox"/> Certificate of Mailing by Express Mail 23. <input checked="" type="checkbox"/> Other items or information: 					
Return receipt postcard					

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR		INTERNATIONAL APPLICATION NO. PCT/DE00/02393		ATTORNEY'S DOCKET NUMBER 112740-516	
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24. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
				\$890.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).				\$0.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =	0	x \$18.00	\$0.00	
Independent claims	1 - 3 =	0	x \$84.00	\$0.00	
Multiple Dependent Claims (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$890.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				\$0.00	
SUBTOTAL =				\$890.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).				\$0.00	
TOTAL NATIONAL FEE =				\$890.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL FEES ENCLOSED =				\$890.00	
				Amount to be refunded	\$
				charged	\$

a. ☒ A check in the amount of **\$890.00** to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

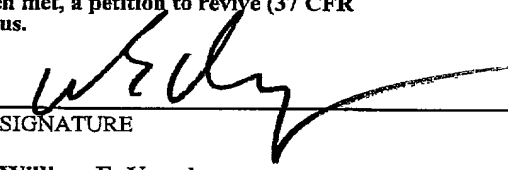
c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **02-1818** A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

William E. Vaughan (Reg. No. 39,056)
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 SIGNATURE

William E. Vaughan
 NAME

39,056
 REGISTRATION NUMBER

January 18, 2002
 DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Markus Imhof
Appl. No.: PCT/DE00/02393
Filed: 21 July 2000
5 Title: MOBILE TELECOMMUNICATION TERMINAL
Art Unit:
Examiner:
Docket No.: 112740-516

10 Assistant Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Sir:

15 Please amend the above-identified International Application before entry into the
National stage before the U.S. Patent and Trademark Office under 35 U.S.C. §371 as follows:

In the Drawings:

Please amend the drawings as indicated in red in the attached Request for Approval of
Drawing Changes.

20 **In the Specification:**

Please replace the Specification of the present application, including the Abstract,
with the following Substitute Specification:

SPECIFICATION

TITLE OF THE INVENTION

25 MOBILE TELECOMMUNICATION TERMINAL

BACKGROUND OF THE INVENTION

The present invention relates to a terminal for telecommunication via switching
centers in a mobile radio network. An embodiment of the present invention may be
employed in a known mobile radio network such as Global System for Mobile
30 Communication (GSM) or a mobile radio network standard under development such as
Universal Mobile Telecommunication System (UMTS) or UMTS Terrestrial Radio Access
(UTRA).

To improve the flexibility of mobile terminals of this type and to make their operation
less expensive for users, a combined terminal which enables the user to choose between
35 communication in the GSM mobile radio network or on the basis of the Digital Enhanced
Cordless Telecommunications (DECT) standard has already been proposed. This terminal
can be used, for example, outdoors in a conventional way for communication in the GSM

network and in the vicinity of a DECT base station for communication via this base station. This allows the user of the terminal, as long as the terminal is within range of the DECT base station, to conduct calls with other terminals connected to the same base station without charge, or to conduct calls with outside subscribers, likewise via the base station, incurring only the fixed network charges, which are generally lower than the costs in the mobile radio network. One disadvantage of this known terminal is that no-charge communication is only possible within the range of the DECT base station. For example, two users of these known combined terminals cannot communicate without charge if they are outside the range of their DECT base station, even if the distance between them is so small that, in principle, one terminal could receive radio signals of the other.

Known for this purpose from WO 98/35515 are multimode mobile radio telephones which have a circuit for realizing a first operating mode for communication with a mobile radio network and a circuit for realizing a second operating mode for communication with further multimode mobile radio telephones without involvement of the mobile radio network.

SUMMARY OF THE INVENTION

An advantage of the present invention is, therefore, to provide a terminal for telecommunication via switching centers in a mobile radio network for network-bound message transmission including an additional transmitter and/or receiver part for network-free message transmission in a freely available frequency range. The freely available frequency range and the frequency band for the network-bound message transmission should preferably be adjacent, so that the same antenna having desirable transmitting/receiving properties can be used for both frequency ranges. For example, the mobile radio network may be a UMTS network with a frequency band at 2 GHz and the freely available frequency range may be an ISM band (Industrial, Scientific, Medical band) at 2.4 GHz.

A terminal according to an embodiment of the present invention can be created with minimal development costs if it includes a transceiver part for the message transmission in the mobile radio network which is separate from the transmitter and/or receiver part for the network-free message transmission. However, to reduce costs, energy consumption and the weight of the terminal, it is desirable to share circuit components as much as possible for the mobile radio network transceiver part and the network-free transmitter and/or receiver part. Thus, oscillators and/or filters are preferably designed in such a way that they can be switched off.

In an embodiment, the terminal may have one or more operating states for the message transmission in the freely available frequency range. One of these may, for

example, support an unprotected multi-subscriber connection. In this operating state, the terminal has all the functionalities of a mobile radio telephone, such as a CB radio telephone.

In an alternative embodiment, an encoder and/or decoder may be provided for encoding/decoding a message signal to be transmitted/received in the freely available frequency range. This encoder or decoder preferably operates on the basis of a CDMA (Code Division Multiple Access) process. Such encoding allows participation in a call taking place in the freely available frequency range to be restricted to those subscribers who have terminals equipped with corresponding encoders, which also use the same codes.

In an embodiment, the code to be used may be fixed by exchanging (at least once) a key between the terminal and a partner terminal. Consequently, it is difficult for third terminals which have not received the exchanged key to intrude in a call in progress. A further possibility is that a key for the encoding/decoding can be set by a user. For example, two users can fix the key in a secure way, by prior agreement, and there is no longer any need for a transmission, which could be monitored.

In a further advantageous embodiment, the terminal can be assigned a user identification for the message transmission in the freely available frequency range, for example, by the user keying in an identification and the identification being stored in a semiconductor memory element of the terminal, or by a chip card on which the identification is stored being inserted into the terminal. Thus, the identification of a partner terminal can be transmitted from the transmitter part for setting up a connection in the freely available frequency range. Accordingly, the receiver part monitors the freely available frequency range for the transmission of the assigned user identification and generates a warning signal for the users if the transmission of the user identification is detected, thereby informing the user that a caller is attempting to reach him.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Invention and the figures.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 shows a schematic block diagram of a terminal according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a schematic block diagram of a terminal according to an embodiment of the present invention. In general, the terminal includes a microphone 1 and a loudspeaker 2, an analog/digital converter 3 for the digitization of the voice signal picked up by the microphone, a digital/analog converter 4, which supplies the loudspeaker with an output

signal, transmitter and receiver parts 5, 6 corresponding to the UMTS standard and an antenna 7. The way in which these components operate is known and need not be dealt with in any detail.

In an embodiment, arranged between the converters 3, 4 and the antenna 7, parallel to the UMTS transmitter and receiver parts are transmitter and receiver parts 8, 9 for the ISM band at 2.4 GHz. A control unit 10 checks the position of two switches 11, which are respectively arranged between the DA converter 4 and the receiver parts 6, 9 and between the AD converter 3 and the transmitter parts 5, 8, and which selectively connect the converters 3, 4 to one of the two transmitter parts 5, 8 or receiver parts 6, 9. A user of the terminal can determine the position of the switches 11 by pressing keys of a conventional keypad of the terminal (not represented), thereby indicating whether the terminal is to operate in an UMTS operating state, in which it behaves like a conventional UMTS terminal, or in an ISM operating state.

In an embodiment of the ISM operating state, the voice signal of the user is emitted in an unprotected manner on a channel of the ISM frequency range and can consequently be picked up and reproduced by any ISM radio telephone within range.

In a further embodiment of the ISM operating state, the voice data supplied by the AD converter 3 are scrambled by the transmitter part 8 in accordance with a predetermined scrambling code and/or are modulated onto a spread-spectrum signal. The output signal of the transmitter part 8 is then only intelligible for a receiver which is familiar with the form of the spread-spectrum signal or the scrambling algorithm and can reverse the operations to obtain an intelligible reproduction signal.

To prepare a scrambled or spectrum-spread transmission, it may be provided in an embodiment that the control unit 10 initially instigates in an unprotected manner the transmission of information concerning a spread-spectrum signal to be used or a scrambling algorithm to be used, and that it and a receiver commence the use of such an algorithm or signal as soon as confirmation of the receiver terminal concerning the cloud reception of this information has been obtained. Thus, the possibility of a third-party intruding in an already existing call connection is restricted considerably.

In another embodiment, it is possible is to make a user specify the spread-spectrum signal to be used or the scrambling algorithm, for example, by key input or by use of a chip card. The use of chip cards, in particular, opens up the possibility of forming "closed user groups" in the ISM band, which, in each case, differ by the protection mechanisms used and communicate discretely with one another.

To permit the targeted calling of a specific subscriber in the ISM band, each terminal according to an embodiment of the present invention, or its user, is assigned a specific identification, which is stored in a memory element of the terminal or the aforementioned chip card such that the control unit can access it. The receiver part 9 continuously monitors the signals received in the ISM band by the antenna 7 to determine whether any of them contain its own user identification. This task can be facilitated, for example, by defining a special channel for the transmission of such identifications, for example, by fixing a narrow frequency range, a time window or a code, which are used for the transmission of the identifications. If the receiver part 9 senses its own code in a received signal, the control unit instigates the output of a warning signal, for example, a conventional ringing signal, or the generation of a mechanical oscillation, which informs the user of the terminal that a caller is attempting to reach him. This warning signal may be a different signal for a call in the ISM band than for a call in the mobile radio network.

Thus, in an embodiment, it is possible to set up targeted call connections between individual subscribers without interconnection by a switching station, such as a base station of a mobile radio network or a DECT base station. Two terminals according to an embodiment of the present invention can, therefore, communicate with each other even when they are outside the range of such a switching station.

It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

ABSTRACT OF THE DISCLOSURE

A mobile telecommunication terminal is provided, wherein the terminal includes a transceiver part for network-bound message transmission in a mobile radio network and a transmitter and/or receiver part for network-free message transmission in a freely available

5 frequency range.

In the Claims:

On page 7, cancel line 1, and substitute the following left-hand justified heading therefor:

CLAIMS

5 Please cancel claims 1-8, without prejudice, and substitute the following claims therefor:

9. A terminal for telecommunication via switching centers in a UMTS mobile radio network, comprising:

10 a transmitter part and a receiver part for network-free message transmission in a freely available frequency range in an ISM band at 2.4 GHz; and

 a transceiver part for message transmission in the UMTS mobile radio network, the transceiver part including at least one of tunable oscillators and filters shared by both the transmitter part and the receiver part.

15 10. A terminal for telecommunication as claimed in Claim 9, wherein the transceiver part is separate from both the transmitter part and the receiver part.

20 11. A terminal for telecommunication as claimed in Claim 9, wherein the terminal has an operating state that supports an unprotected multi-subscriber connection in the freely available frequency range.

25 12. A terminal for telecommunication as claimed in Claim 9, further comprising an encoder for encoding a message signal to be transmitted in the freely available frequency range based on a CDMA process.

 13. A terminal for telecommunication as claimed in Claim 12, wherein the encoding includes exchanging a key with a partner terminal for setting up a connection in the freely available frequency range.

30 14. A terminal for telecommunication as claimed in Claim 12, wherein a key for the encoding can be set by a user.

15. A terminal for telecommunication as claimed in Claim 9, further comprising a decoder for decoding a message signal to be received in the freely available frequency range based on a CDMA process.

5 16. A terminal for telecommunication as claimed in Claim 15, wherein the decoding includes exchanging a key with a partner terminal for setting up a connection in the freely available frequency range.

10 17. A terminal for telecommunication as claimed in Claim 15, wherein a key for the decoding can be set by a user.

15 18. A terminal for telecommunication as claimed in Claim 9, wherein the terminal is assigned a user identification for the message transmission in the freely available frequency range, and wherein the transmitter part transmits the user identification of a desired partner terminal for setting up a connection in the freely available frequency range.

20 19. A terminal for telecommunication as claimed in Claim 9, wherein the terminal is assigned a user identification for the message transmission in the freely available frequency range, and wherein the receiver part monitors the freely available frequency range for the transmission of the assigned user identification and generates a warning signal for the user if the transmission of the user identification is detected.

REMARKS

The present amendment makes editorial changes and corrects typographical errors in the specification, which includes the Abstract, in order to conform the specification to the requirements of United States Patent Practice. No new matter is added thereby. Attached hereto is a marked-up version of the changes made to the specification by the present amendment. The attached page is captioned "Version With Markings To Show Changes Made".

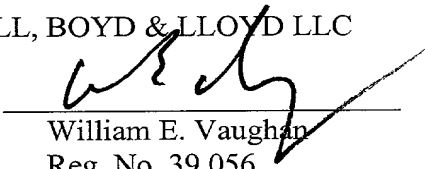
In addition, the present amendment cancels original claims 1-8 in favor of new claims 9-19. Claims 9-19 have been presented solely because the revisions by red-lining and underlining which would have been necessary in claims 1-8 in order to present those claims in accordance with preferred United States Patent Practice would have been too extensive, and thus would have been too burdensome. The present amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 U.S.C. §§101, 102, 103 or 112. Indeed, the cancellation of claims 1-8 does not constitute an intent on the part of the Applicants to surrender any of the subject matter of claims 1-8.

Early consideration on the merits is respectfully requested.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY


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VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The Specification of the present application, including the Abstract, has been amended as follows:

5

SPECIFICATION

TITLE OF THE INVENTION

MOBILE TELECOMMUNICATION TERMINAL

BACKGROUND OF THE INVENTION

10 Description

Mobile telecommunication terminal

The present invention relates to a terminal for telecommunication via switching centers in a mobile radio network, ~~such as for instance the known GSM network or the UMTS or UTRA.~~ An embodiment of the present invention may be employed in a known
15 mobile radio network such as Global System for Mobile Communication (GSM) or a mobile radio network standard under development such as Universal Mobile Telecommunication System (UMTS) or UMTS Terrestrial Radio Access (UTRA).

To improve the flexibility of mobile terminals of this type and to make their operation less expensive for users, a combined terminal which enables the user to choose between
20 communication in the GSM mobile radio network or on the basis of the ~~DECT~~ Digital Enhanced Cordless Telecommunications (DECT) standard has already been proposed. This terminal can be used, for example, outdoors in a conventional way for communication in the GSM network and in the vicinity of a DECT base station for communication via this base station. This allows the user of the terminal, as long as ~~it~~ the terminal is within range of the
25 DECT base station, to conduct calls with other terminals connected to the same base station without charge, or to conduct calls with outside subscribers, likewise via the base station, incurring ~~for such calls~~ only the fixed network charges, which are generally lower than the costs in the mobile radio network. One disadvantage of this known terminal is that no-charge communication is only ~~ever~~ possible within the range of the DECT base station. For ~~instance~~
30 example, two users of these known combined terminals cannot communicate without charge if they are outside the range of their DECT base station, even if the distance between them is so small that, in principle, one terminal could receive radio signals of the other.

Known for this purpose from WO 98/35515 are multimode mobile radio telephones which have a circuit for realizing a first operating mode for communication with a mobile

radio network and a circuit for realizing a second operating mode for communication with further multimode mobile radio telephones without involvement of the mobile radio network.

SUMMARY OF THE INVENTION

An advantage of ~~To overcome this disadvantage, it is proposed according to the~~ present invention is, therefore, to provide a terminal for telecommunication via switching centers in a mobile radio network for network-bound message transmission ~~additionally with~~ a including an additional transmitter and/or receiver part for network-free message transmission in a freely available frequency range. The freely available frequency range and the frequency band for the network-bound message transmission should preferably be adjacent, so that ~~one and the same antenna with good~~ having desirable transmitting/receiving properties can be used ~~on the terminal~~ for both frequency ranges. For example, the mobile radio network may be a UMTS network with a frequency band at 2 GHz and the freely available frequency range may be an ISM band (Industrial, Scientific, Medical band) at 2.4 GHz.

~~Such a~~ A terminal according to an embodiment of the present invention can be created with minimal development costs if it ~~comprises~~ includes a transceiver part for the message transmission in the mobile radio network which is separate from the transmitter and/or receiver part for the network-free message transmission. ~~To block~~ However, to reduce costs, energy consumption and the weight of the terminal, it is ~~expedient however~~ desirable to share circuit components as ~~far~~ much as possible for the mobile radio network transceiver part and the network-free transmitter and/or receiver part. ~~For this purpose~~ Thus, oscillators and/or filters ~~can~~ are preferably ~~be~~ designed in such a way that they can be switched off.

In an embodiment, ~~The~~ terminal may have one or more operating states for the message transmission in the freely available frequency range. One of these may, for example, support an unprotected multi-subscriber connection. In this operating state, the terminal has all the functionalities of a mobile radio telephone, such as ~~for instance~~ a CB radio telephone.

~~Alternatively or in addition~~ In an alternative embodiment, an encoder and/or decoder may be provided for encoding/decoding a message signal to be transmitted/received in the freely available frequency range. This encoder or decoder preferably operates on the basis of a CDMA (Code Division Multiple Access) process. Such encoding allows participation in a call taking place in the freely available frequency range to be restricted to those subscribers who have terminals equipped with corresponding encoders, which also use the same codes.

In ~~this case~~ an embodiment, the code to be used may be fixed by exchanging ~~-(at least once-)~~ a key between the terminal and a partner terminal. Consequently, it is ~~at least only possible with difficulty~~ difficult for third terminals which have not received the exchanged key to intrude in a call in progress. A further possibility is that a key for the encoding/decoding can be set by a user. For ~~instance~~ example, two users can fix the key in a secure way, ~~for example~~ by prior agreement, and there is no longer any need for a transmission, which could be monitored.

~~It is also~~ In a further advantageous if embodiment, the terminal can be assigned a user identification for the message transmission in the freely available frequency range, for example, by the user keying in an identification and the identification being stored in a semiconductor memory element of the terminal, or by a chip card on which the identification is stored being inserted into the terminal. ~~Such an~~ Thus, the identification of ~~such~~ a partner terminal can be transmitted from the transmitter part for ~~the~~ setting up ~~of~~ a connection in the freely available frequency range. Accordingly, the receiver part monitors the freely available frequency range for the transmission of the assigned user identification and generates a warning signal for the users if the transmission of the user identification is detected, ~~to inform~~ thereby informing the user that a caller is attempting to reach him.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Invention and the figures.

BRIEF DESCRIPTION OF THE FIGURES

Figure 1 ~~The figure~~ shows a schematic block diagram of a terminal according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 shows a schematic block diagram of a terminal according to an embodiment of the present invention. ~~It comprises, in a way known per se,~~ In general, the terminal includes a microphone 1 and a loudspeaker 2, an analog/digital converter 3 for the digitization of the voice signal picked up by the microphone, a digital/analog converter 4, which supplies the loudspeaker with an output signal, transmitter and receiver parts 5, 6 corresponding to the UMTS standard and ~~also~~ an antenna 7. The way in which these components operate is known and need not be dealt with in any detail.

~~Arranged~~ In an embodiment, arranged between the converters 3, 4 and the antenna 7 ~~there are in each case,~~ parallel to the UMTS transmitter and receiver parts are transmitter and receiver parts 8, 9 for the ISM band at 2.4 GHz. A control unit 10 checks the position of two switches 11, which are respectively arranged between the DA converter 4 and the receiver

parts 6, 9 and between the AD converter 3 and the transmitter parts 5, 8, and ~~in each case~~
which selectively connect the converters ~~selectively~~ 3, 4 to one of the two transmitter parts 5,
8 or receiver parts 6, 9. A user of the terminal can determine the position of the switches 11
by pressing keys of a conventional keypad of the terminal (not represented) ~~and thus~~
5 ~~establish, thereby indicating~~ whether the terminal is to operate in an UMTS operating state, in
which it behaves like a conventional UMTS terminal, or in an ISM operating state.

~~The~~ In an embodiment of the ISM operating state ~~comprises several variants. In a first~~
~~variant,~~ the voice signal of the user is emitted in an unprotected manner on a channel of the
ISM frequency range and can consequently be picked up and reproduced by any ISM radio
10 telephone within range.

In a ~~second variant, it is provided that~~ further embodiment of the ISM operating state,
the voice data supplied by the AD converter 3 are scrambled by the transmitter part 8 in
accordance with a predetermined scrambling code and/or are modulated onto a spread-
spectrum signal. The output signal of the transmitter part 8 is then only intelligible for a
15 receiver which is familiar with the form of the spread-spectrum signal or the scrambling
algorithm and can reverse the operations to obtain an intelligible reproduction signal.

To prepare a scrambled or spectrum-spread transmission, it may be provided in an
embodiment that the control unit 10 initially instigates in an unprotected manner the
transmission of information concerning a spread-spectrum signal to be used or a scrambling
20 algorithm to be used, and that it and a receiver commence the use of such an algorithm or
signal as soon as confirmation of the receiver terminal concerning the cloud reception of this
information has been obtained. ~~The possibilities~~ Thus, the possibility of a third-party
intruding in an already existing call connection ~~are consequently~~ is restricted considerably.

~~Another possibility~~ In another embodiment, it is possible is to make a user specify the
25 spread-spectrum signal to be used or the scrambling algorithm, for example, by key input or
by use of a chip card. The use of chip cards, in particular, opens up the possibility of forming
“closed user groups” in the ISM band, which, in each case, differ by the protection
mechanisms used and communicate discretely with one another.

To permit the targeted calling of a specific subscriber in the ISM band, each terminal
30 according to an embodiment of the present invention, or its user, is assigned a specific
identification, which is stored in a memory element of the terminal or the aforementioned
chip card ~~in such a way~~ that the control unit can access it. The receiver part 9 continuously
monitors the signals received in the ISM band by the antenna 7 ~~for to determine~~ whether any
of them contain its own user identification ~~is contained in them~~. This task can be facilitated,

for example, by defining a special channel ~~being defined~~ for the transmission of such identifications, for example, by fixing a narrow frequency range, a time window or a code, which are used for the transmission of the identifications. If the receiver part 9 senses ~~is~~ its own code in ~~the reception~~ a received signal, the control unit 10 instigates the output of a warning signal, for example, a conventional ringing signal, or the generation of a mechanical oscillation, which informs the user of the terminal that a caller is attempting to reach him. This warning signal may be a different signal ~~in the case of~~ for a call in the ISM band than ~~in the case of~~ for a call in the mobile radio network.

~~This creates the possibility of setting~~ Thus, in an embodiment, it is possible to set up targeted call connections between individual subscribers without interconnection ~~of~~ by a switching station, such as ~~for instance~~ a base station of a mobile radio network or a DECT base station. Two terminals according to an embodiment of the present invention can, therefore, communicate with each other even when they are outside the range of such a switching station.

It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

Abstract

Mobile telecommunication terminal

~~A terminal comprises a transceiver part (5, 6) for network bound message transmission in a mobile radio network and a transmitter and/or receiver part (8, 9) for network free message transmission in a freely available frequency range.~~

Figure

ABSTRACT OF THE DISCLOSURE

A mobile telecommunication terminal is provided, wherein the terminal includes a transceiver part for network-bound message transmission in a mobile radio network and a transmitter and/or receiver part for network-free message transmission in a freely available frequency range.

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Description

Mobile telecommunication terminal

- 5 The present invention relates to a terminal for telecommunication via switching centers in a mobile radio network, such as for instance the known GSM network or the UMTS or UTRA standard under development.
- 10 To improve the flexibility of mobile terminals of this type and to make their operation less expensive for users, a combined terminal which enables the user to choose between communication in the GSM mobile radio network or on the basis of the DECT standard has
- 15 already been proposed. This terminal can be used for example outdoors in a conventional way for communication in the GSM network and in the vicinity of a DECT base station for communication via this base station. This allows the user of the terminal, as long
- 20 as it is within range of the DECT base station, to conduct calls with other terminals connected to the same base station without charge, or conduct calls with outside subscribers, likewise via the base station, incurring for such calls only the fixed network
- 25 charges, which are generally lower than the costs in the mobile radio network. One disadvantage of this known terminal is that no-charge communication is only ever possible within the range of the DECT base station. For instance, two users of these known
- 30 combined terminals cannot communicate without charge if they are outside the range of their base station, even if the distance between them is so small that in principle one terminal could receive radio signals of the other.
- 35 Known for this purpose from WO 98/35515 are multimode mobile radio telephones which have a circuit for

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realizing a first operating mode for communication with
a mobile radio network and a circuit for realizing a
second operating mode for communication with further
multimode mobile radio telephones without involvement
5 of the mobile radio network.

To overcome this disadvantage, it is proposed according
to the present invention to provide a terminal for
telecommunication via switching centers in a mobile
10 radio network for network-bound message transmission
additionally with a

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transmitter and/or receiver part for network-free message transmission in a freely available frequency range. The freely available frequency range and the frequency band for the network-bound message transmission should preferably be adjacent, so that one and the same antenna with good transmitting/receiving properties can be used on the terminal for both frequency ranges. For example, the mobile radio network may be a UMTS network with a frequency band at 2 GHz and the freely available frequency range may be an ISM band at 2.4 GHz.

Such a terminal can be created with minimal development costs if it comprises a transceiver part for the message transmission in the mobile radio network which is separate from the transmitter and/or receiver part for the network-free message transmission. To block costs, energy consumption and weight of the terminal, it is expedient however to share circuit components as far as possible for the mobile radio network transceiver part and the network-free transmitter and/or receiver part. For this purpose, oscillators and/or filters can preferably be designed in such a way that they can be switched off.

The terminal may have one or more operating states for the message transmission in the freely available frequency range. One of these may, for example, support an unprotected multi-subscriber connection. In this operating state, the terminal has all the functionalities of a mobile radio telephone, such as for instance a CB radio telephone.

Alternatively or in addition, an encoder and/or decoder may be provided for encoding/decoding a message signal to be transmitted/received in the freely available frequency range. This encoder or decoder preferably operates on the basis of a CDMA process. Such encoding

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allows participation in a call taking place in the
freely available frequency range to be restricted to
those

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subscribers who have terminals equipped with corresponding encoders, which also use the same codes.

In this case, the code to be used may be fixed by exchanging - at least once - a key between the terminal and a partner terminal. Consequently, it is at least only possible with difficulty for third terminals which have not received the exchanged key to intrude in a call in progress. A further possibility is that a key for the encoding/decoding can be set by a user. For instance, two users can fix the key in a secure way, for example by prior agreement, and there is no longer any need for a transmission, which could be monitored.

It is also advantageous if the terminal can be assigned a user identification for the message transmission in the freely available frequency range, for example by the user keying in an identification and the identification being stored in a semiconductor memory element of the terminal, or by a chip card on which the identification is stored being inserted into the terminal. Such an identification of such a partner terminal can be transmitted from the transmitter part for the setting up of a connection in the freely available frequency range. Accordingly, the receiver part monitors the freely available frequency range for the transmission of the assigned user identification and generates a warning signal for the users if the transmission of the user identification is detected, to inform the user that a caller is attempting to reach him.

The figure shows a schematic block diagram of a terminal according to the invention. It comprises, in a way known per se, a microphone 1 and a loudspeaker 2, an analog/digital converter 3 for the digitization of the voice signal picked up by the microphone, a digital/analog converter 4, which supplies the

loudspeaker with an output signal, transmitter and receiver parts 5, 6 to the UMTS standard and also an antenna 7. The way in which these components operate is known and need not be dealt with in any detail.

5

Arranged between the converters 3, 4 and the antenna 7 there are in each case parallel to the UMTS transmitter and receiver parts transmitter and receiver parts 8, 9 for the ISM band at 2.4 GHz. A control unit 10 checks the position of two switches 11, which are respectively arranged between the DA converter and the receiver parts 6, 9 and between the AD converter and the transmitter parts 5, 8, and in each case connect the converters selectively to one of the two transmitter parts or receiver parts. A user of the terminal can determine the position of the switches 11 by pressing keys of a conventional keypad of the terminal (not represented) and thus establish whether the terminal is to operate in an UMTS operating state, in which it behaves like a conventional UMTS terminal, or an ISM operating state.

The ISM operating state comprises several variants. In a first variant, the voice signal of the user is emitted in an unprotected manner on a channel of the ISM frequency range and can consequently be picked up and reproduced by any ISM radio telephone within range.

In a second variant, it is provided that the voice data supplied by the AD converter 3 are scrambled by the transmitter part 8 in accordance with a predetermined scrambling code and/or are modulated onto a spread-spectrum signal. The output signal of the transmitter part 8 is then only intelligible for a receiver which is familiar with the form of the spread-spectrum signal or the scrambling algorithm and can reverse the operations to obtain an intelligible reproduction signal.

To prepare a scrambled or spectrum-spread transmission, it may be provided that the control unit 10

[illegible]

initially instigates in an unprotected manner the transmission of information concerning a spread-spectrum signal to be used or a scrambling algorithm to be used, and that it and a receiver commence the use of
5 such an algorithm or signal as soon as confirmation of the receiver terminal concerning the cloud reception of this information has been obtained. The possibilities of a third-party intruding in an already existing call connection are consequently restricted considerably.

10

Another possibility is to make a user specify the spread-spectrum signal to be used or the scrambling algorithm, for example by key input or use of a chip card. The use of chip cards in particular opens up the
15 possibility of forming "closed user groups" in the ISM band, which in each case differ by the protection mechanisms used and communicate discretely with one another.

20 To permit the targeted calling of a specific subscriber in the ISM band, each terminal according to the invention, or its user, is assigned a specific identification, which is stored in a memory element of the terminal or the aforementioned chip card in such a
25 way that the control unit can access it. The receiver part 9 continuously monitors the signals received in the ISM band by the antenna 7 for whether its own user identification is contained in them. This task can be facilitated for example by a special channel being
30 defined for the transmission of such identifications, for example by fixing a narrow frequency range, a time window or a code, which are used for the transmission of the identifications. If the receiver part 9 senses its own code in the reception signal, the control unit
35 10 instigates the output of a warning signal, for example a conventional ringing signal, or the generation of a mechanical oscillation, which informs the user of the terminal

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that a caller is attempting to reach him. This warning signal may be a different signal in the case of a call in the ISM band than in the case of a call in the mobile radio network.

5

This creates the possibility of setting up targeted call connections between individual subscribers without interconnection of a switching station, such as for instance a base station of a mobile radio network or a
10 DECT base station. Two terminals according to the invention can therefore communicate with each other even when they are outside the range of such a switching station.

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Patent claims

1. A terminal for telecommunication via switching centers in a mobile radio network, characterized in that it additionally has a transmitter and/or receiver part (8, 9) for network-free message transmission in a freely available frequency range.
2. The terminal as claimed in claim 1, characterized in that the mobile radio network is a UMTS network.
3. The terminal as claimed in claim 1 or 2, characterized in that the freely available frequency range is an ISM band, preferably the ISM band at 2.4 GHz.
4. The terminal as claimed in one of the preceding claims, characterized in that it comprises a transceiver part (5, 6) for message transmission in the mobile radio network, which is separate from the transmitter and/or receiver part (8, 9) for network-free message transmission.
5. The terminal as claimed in one of claims 1 to 3, characterized in that it comprises a transceiver part (5, 6) for message transmission in the mobile radio network which comprises tunable oscillators and/or filters which belong at the same time to the transmitter and/or receiver part (8, 9) for network-free message transmission.
6. The terminal as claimed in one of the preceding claims, characterized in that it has an operating state in that it supports an unprotected multi-subscriber connection in the freely available frequency range.

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7. The terminal as claimed in one of the preceding claims, characterized in that it has an encoder and/or encoder for encoding/decoding a

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Patent claims

1. A terminal for telecommunication via switching
centers in a mobile radio network having an
5 additional transmitter and/or a receiver part (8,
9) for network-free message transmission in a
freely available frequency range, characterized in
that the mobile radio network is a UMTS network and
the freely available frequency range is an ISM
10 band, preferably the ISM band at 2.4 GHz, and the
terminal comprising a transceiver part (5, 6) for
message transmission in the mobile radio network
which comprises tunable oscillators and/or filters
which belong at the same time to the transmitter
15 and/or receiver part (8, 9) for network-free
message transmission.
2. The terminal as claimed in one of the preceding
claims, characterized in that it comprises a
20 transceiver part (5, 6) for message transmission in
the mobile radio network which is separate from the
transmitter and/or receiver part (8, 9) for
network-free message transmission.
- 25 3. The terminal as claimed in one of the preceding
claims, characterized in that it has an operating
state in that it supports an unprotected multi-
subscriber connection in the freely available
frequency range.
- 30 4. The terminal as claimed in one of the preceding
claims, characterized in that it has an encoder
and/or decoder for encoding/decoding a message
signal to be transmitted/received in the freely
35 available frequency range, in particular on the
basis of a CDMA process.

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5. The terminal as claimed in claim 3, characterized
in that it exchanges a key for the
encoding/decoding with a partner terminal for
5 setting up a connection in the freely available
frequency range.

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6. The terminal as claimed in claim 3, characterized in that a key for the encoding/decoding can be set by a user.

5 7. The terminal as claimed in one of the preceding
claims, characterized in that it can be assigned a
user identification for the message transmission in
the freely available frequency range, and in that
the transmitter part (8) transmits the user
10 identification of a desired partner terminal for
the setting up of a connection in the freely
available frequency range.

15 8. The terminal as claimed in one of the preceding
claims, characterized in that it can be assigned a
user identification for the message transmission in
the freely available frequency range, and in that
the receiver part (9) monitors the freely available
frequency range for the transmission of the
20 assigned user identification and generates a
warning signal for the user if the transmission of
the user identification is detected.

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Abstract

Mobile telecommunication terminal

A terminal comprises a transceiver part (5, 6) for network-bound message transmission in a mobile radio network and a transmitter and/or receiver part (8, 9) for network-free message transmission in a freely available frequency range.

Figure

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Markus Imhof
Appl. No.: PCT/DE00/02393
5 Filed: 21 July 2000
Title: MOBILE TELECOMMUNICATION TERMINAL
Art Unit:
Examiner:
10 Docket No.: 112740-516

Assistant Commissioner of Patents
Washington, D.C. 20231

REQUEST FOR APPROVAL OF DRAWING CHANGES

15 Applicants respectfully request approval of the drawing changes indicated in red to Figure
1 attached herewith. This request is being submitted along with Applicant's Preliminary
Amendment submitted of the above-identified International Application before entry into the
National stage before the U.S. Patent and Trademark Office under 35 U.S.C. §371.

Respectfully submitted,

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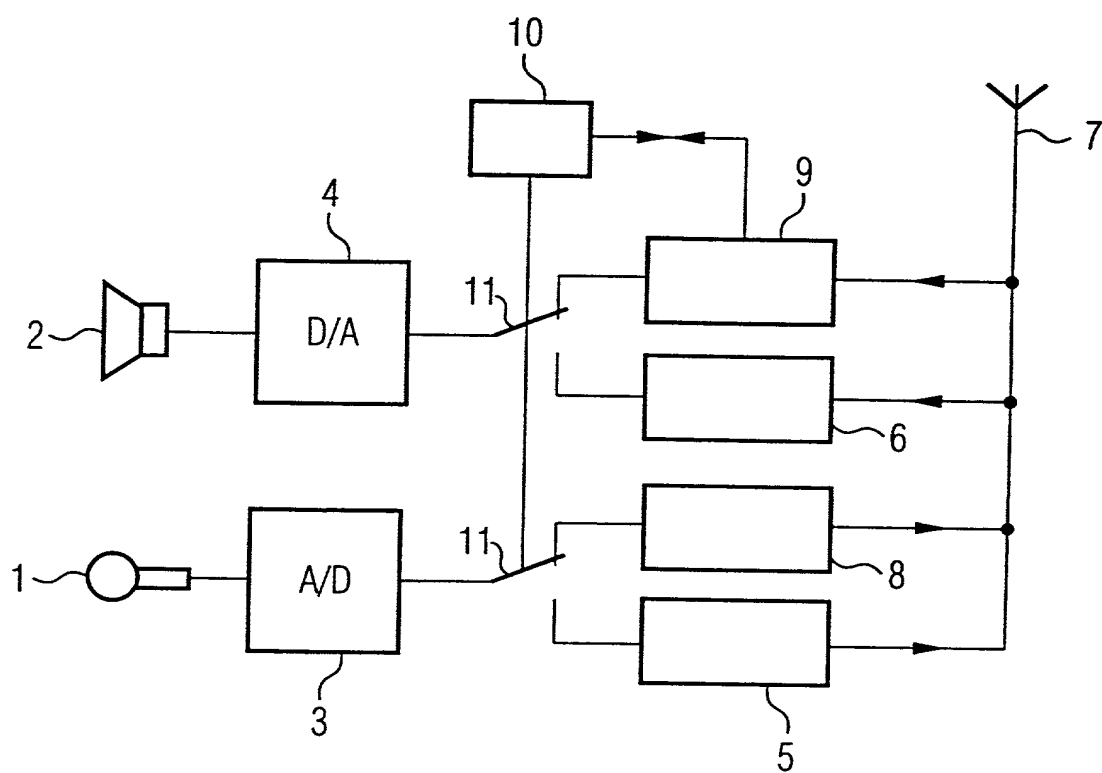


FIG. 1

German Language Declaration

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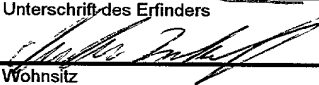
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Unterschrift des Erfinders	Datum	Second Inventor's signature	Date
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(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

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German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

19934252.0
(Number)
(Nummer)

DE
(Country)
(Land)

21.07.1999
(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☒ ☐
Yes No
Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐ ☐
Yes No
Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐ ☐
Yes No
Ja Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/02393
(Application Serial No.)
(Anmeldeseriennummer)

21.07.2000
(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

anhängig
(Status)
(patentiert, anhängig,
aufgegeben)

pending
(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date D,M,Y)
(Anmeldedatum T, M; J)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
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